

# MONTHLY WEATHER REVIEW

Editor, EDGAR W. WOOLARD

VOL. 68, No. 9  
W. B. No. 1307

SEPTEMBER 1940

CLOSED NOV. 3, 1940  
ISSUED DECEMBER 30, 1940

## HIGHEST AND LOWEST SEA-LEVEL PRESSURES OBSERVED IN THE UNITED STATES

By EDWARD H. BOWIE

[Weather Bureau, San Francisco, Calif., June 1940]

A mass of statistics is contained in the Climatological Record kept at all Weather Bureau stations manned by commissioned personnel, in the United States and their territories and insular possessions. These statistics cover monthly and annual averages, and extremes of barometric pressures reduced to, and not reduced to, sea level; averages of temperatures by days, months, and years, and extremes; various values for wind directions and velocities; precipitation data in the form of monthly and annual averages; records of unusual falls of rain in short periods of time and falls of snow (unmelted) and rainfall and snowfall by days; and records of sunshine and nebulosity. Dates of thunderstorms and other unusual phenomena are entered in this log, which now consists of several large books at stations having long records. It would be interesting to speculate on why those interested in writing on the climates of the United States do not more frequently call for the data contained in these record books. Perhaps, sooner or later, these highly valued logs, or copies of them, will be placed in the Hall of Archives in Washington where all students of climate of our country may consult them.

Among the interesting facts contained in these record books are those of the highest and lowest sea-level pressures observed. So far as is known the record of these extreme pressures has never heretofore been brought together for publication, although the station Annual Meteorological Summaries contain them.

On February 3, 1940, letters were addressed to all Weather Bureau stations asking them to extract from the Climatological Record Book the data relating to the highest and lowest sea-level pressures observed at their respective stations since these data were first recorded. The data thus gathered for all regular Weather Bureau stations in the United States having a length of record of more than 10 years will be found in the table that follows. These pressures are all reduced to a common datum, sea level, in accordance with internationally recognized procedure.

An examination of the extremes given in the table discloses the fact that the highest reduced pressure ever observed at a Weather Bureau station in the United States was 31.29 inches at Lander, Wyo., on December 20, 1924; and the lowest, 27.61 inches at Miami, Florida, on September 18, 1926. While the Miami record is that of a tropical cyclone, it is interesting to have here again recorded the extremely low pressure observed at St. Louis, Mo., at the time of the occurrence of a tornado on May 27, 1896. In the article on this tornado by H. C. Franken-

field, MONTHLY WEATHER REVIEW, March 1896, there is added a note to the effect that an aneroid barometer privately owned by Park Commissioner Klemm showed a reading, when reduced to sea-level, of 27.30 inches. The place of observation was near the center of the tornado. It should also be noted that during the hurricane of September 2, 1935, a pressure of 26.35 inches was observed at one of the Florida Keys (MONTHLY WEATHER REVIEW, October 1935, p. 295).

A further examination of the data in this table discloses the fact that the least range in sea-level pressure for any station has been 1.07 inches at San Diego, Calif., in a period of 68 years; and that the maximum range for any station has been 3.02 inches, at Hartford, Conn., in a period of 35 years.

According to months of occurrence, 60 percent of the highest pressures observed occurred in the month of January, less than 20 percent occurred in February and December, respectively, and less than 1 percent occurred in March and likewise in November. At no station was the highest pressure of record observed in any of the months of April to October inclusive.

Unlike the occurrences of the highest pressure, lowest pressures of record were recorded at one or more stations in all months save June and July. The greatest frequency of occurrence of lowest pressures of record attending winter cyclones was in January, more than 30 percent of the recorded lowest pressures occurring in that month. A secondary frequency of occurrence of the lowest pressures of record is in September and this is unquestionably associated with the tropical storms of this time of the year. All record low pressures in September occurred at stations on or near the Gulf of Mexico and the Atlantic Ocean. The lowest pressures of record for the months of August and October likewise occurred at stations on or near the Gulf of Mexico and the Atlantic Ocean and were no doubt associated with tropical cyclones. Stations in other parts of the United States recorded no lowest pressures of record in any month from June to October inclusive. It follows that the maximum number of lowest pressures of record are associated with winter cyclones and a secondary maximum of frequency of occurrence of lowest pressures of record occurs in connection with the tropical cyclones of the late summer and the fall months.

The extreme range of pressure for the United States is 3.68 inches, it being the difference between the maximum of record, 31.29, at Lander, and the lowest of record, 27.61, at Miami.

TABLE 1.—Extremes and range of pressure (in inches reduced to sea-level) for the period of record at Weather Bureau stations

[Records include January 1940]

Station	Length of record	Highest	Date	Lowest	Date	Range
	Years	Inches	M. D. Y.	Inches	M. D. Y.	Inches
Abilene	54	31.06	2/12/99	29.18	3/20/32	1.88
Albany	66	31.10	1/31/20	28.46	1/8/13	2.64
Alpena	48	31.09	2/9/34	28.66	3/6/29	2.43
Amarillo	48	31.01	12/20/24	29.05	2/12/99	1.96
Apalachicola	18	30.70	1/6/24	29.06	*9/30/29	1.64
Asheville	37	30.90	1/6/24	29.02	*1/19/36	1.88
Atlanta	30	30.79	1/6/24	29.08	1/11/18	1.71
Atlantic City	66	30.98	1/27/13	28.37	3/6/32	2.61
Augusta	68	30.85	1/2/99	28.97	3/6/32	1.88
Austin	13	30.78	1/1/28	29.35	5/3/33	1.43
Baker	50	31.09	1/21/30	28.94	2/-/91	2.15
Baltimore	69	31.02	1/27/27	28.68	3/6/32	2.34
Binghamton	43	31.07	1/27/27	28.36	1/3/13	2.71
Birmingham	36	30.88	1/6/24	29.16	1/11/18	1.72
Bismarck	50	31.18	12/28/17	28.62	3/15/20	2.56
Block Island	59	30.98	2/1/20	28.20	3/7/32	2.78
Boise	40	31.13	1/21/30	29.12	4/26/37	2.01
Boston	69	31.03	2/1/20	28.45	4/7/32	2.58
Brownsville	17	30.88	1/5/24	28.02	9/5/33	2.86
Buffalo	69	31.03	1/26/27	28.74	1/3/13	2.29
Burlington	35	31.12	1/31/20	28.28	1/3/13	2.84
Cairo	39	31.00	1/5/24	28.92	2/27/02	2.08
Canton	33	31.08	1/31/20	28.20	1/3/13	2.88
Cape Henry	66	30.93	1/27/27	28.32	3/6/32	2.61
Charles City	35	31.02	1/26/27	28.95	*1/3/06	2.07
Charleston	69	30.83	1/2/99	28.78	3/6/32	2.05
Charlotte	62	30.91	1/2/99	28.94	3/6/32	1.97
Chattanooga	61	30.92	1/6/24	29.07	1/11/18	1.85
Cheyenne	68	31.05	12/9/98	28.89	3/14/20	2.16
Chicago	68	30.97	1/26/27	28.70	3/12/23	2.27
Cincinnati	67	30.93	*1/18/21	28.87	2/28/02	2.06
Cleveland	58	30.97	2/9/34	28.88	*1/12/18	2.09
Columbia, Mo.	50	31.09	1/5/24	28.90	2/28/02	2.19
Columbia, S. C.	53	30.85	1/19/21	28.80	3/6/32	2.05
Columbus	61	30.95	1/26/27	28.87	2/21/12	2.08
Concord	37	31.08	2/1/20	28.55	3/7/32	2.53
Concordia	54	31.11	1/25/05	28.81	3/29/24	2.30
Corpus Christi	53	30.93	1/5/24	28.65	9/14/19	2.28
Dallas	31	31.00	1/5/24	29.27	3/6/30	1.73
Davenport	31	31.02	12/20/24	28.69	2/28/02	2.33
Dayton	27	30.92	1/26/27	28.92	2/21/12	2.00
Del Rio	30	30.95	1/5/24	28.69	8/19/16	2.26
Denver	68	31.13	2/11/99	28.84	1/12/32	2.29
Des Moines	58	31.05	12/20/24	28.76	2/28/02	2.29
Detroit	69	31.04	2/9/34	28.82	1/12/18	2.22
Devils Lake	34	31.15	12/28/17	28.69	1/7/06	2.46
Dodge City	65	31.14	12/9/98	28.63	5/-/78	2.45
Dubuque	48	31.03	1/26/27	28.68	1/3/06	2.35
Duluth	58	31.05	1/26/27	28.75	3/16/20	2.30
Eastport	55	31.04	2/1/20	28.24	12/16/16	2.80
Elkins	31	31.00	1/2/99	28.87	1/12/18	2.13
El Paso	30	30.82	2/12/99	29.28	3/20/32	1.54
Erie	67	31.02	1/26/27	28.61	11/9/13	2.41
Escanaba	59	31.08	1/26/27	28.64	12/14/20	2.44
Eureka	51	30.71	12/9/23	28.93	2/2/15	1.78
Evansville	42	30.99	12/10/19	28.93	2/28/02	2.06
Fort Smith	31	31.04	1/5/24	29.04	2/13/19	2.00
Fort Wayne	28	30.97	1/26/27	28.93	2/25/26	2.04
Fort Worth	41	31.00	2/12/99	29.14	2/27/02	1.86
Fresno	53	30.64	*2/1/16	29.10	1/27/16	1.54
Galveston	69	30.90	1/6/24	28.55	9/8/00	2.35
Grand Junction	41	30.93	1/5/24	28.98	12/25/16	1.95
Grand Rapids	36	31.07	1/26/27	28.78	2/25/26	2.29
Green Bay	31	31.09	1/26/27	28.69	12/14/20	2.40
Greenville, S. C.	30	30.84	1/19/21	29.05	1/11/18	1.79
Harrisburg	51	31.04	1/27/27	28.62	1/3/13	2.42
Hartford	35	31.06	2/1/20	28.04	9/21/38	3.02
Cape Hatteras	48	30.86	1/2/99	28.26	9/16/33	2.60
Havre	58	31.21	12/31/27	28.80	1/11/32	2.41
Helena	60	31.10	1/14/88	28.92	1/11/32	2.18
Houston	30	30.91	1/5/24	28.20	8/17/15	2.71
Huron	58	31.18	12/28/17	28.78	3/15/20	2.40
Indianapolis	69	30.95	12/10/19	28.78	2/28/02	2.17
Ithaca	40	31.03	1/27/27	28.84	1/12/18	2.19
Jacksonville	67	30.67	1/6/24	28.90	9/18/28	1.77
Kalispell	41	31.19	1/4/24	29.04	1/26/14	2.15
Kansas City	51	31.11	1/5/24	28.86	3/29/24	2.25
Keokuk	68	31.06	12/20/24	28.78	2/28/02	2.28
Key West	69	30.52	12/29/94	28.47	10/17/10	2.05
Knoxville	67	30.87	2/5/75	28.95	1/11/18	1.92
La Crosse	66	31.10	1/26/27	28.82	10/16/80	2.28
Lander	49	31.29	12/20/24	28.85	1/12/32	2.44
Lansing	30	31.04	2/9/34	28.81	2/25/26	2.23
Lincoln	43	31.08	1/25/05	28.78	3/29/24	2.30
Little Rock	30	30.98	1/5/24	28.93	2/27/02	2.05
Los Angeles	30	30.59	2/17/83	29.26	3/10/12	1.33
Louisville	30	30.98	*1/-/24	28.94	2/-/02	2.04
Lynchburg	20	30.96	1/27/27	28.90	1/3/13	2.06

TABLE 1.—Extremes and range of pressure (in inches reduced to sea-level) for the period of record at Weather Bureau stations—Con.

[Records include January 1940]

Station	Length of record	Highest	Date	Lowest	Date	Range
	Years	Inches	M. D. Y.	Inches	M. D. Y.	Inches
Macon	41	30.83	1/6/24	29.11	1/11/18	1.72
Madison	35	31.06	1/26/27	28.68	1/3/06	2.38
Marquette	50	31.08	1/26/27	28.63	12/14/20	2.45
Memphis	67	30.96	1/5/24	28.96	2/27/02	2.00
Meridian	50	30.89	1/6/24	29.22	1/11/18	1.67
Miami	29	30.51	*1/6/28	27.61	9/18/26	2.90
Miles City	48	31.26	2/11/99	28.86	2/6/00	2.40
Milwaukee	69	31.00	1/26/27	28.77	2/28/02	2.23
Minneapolis	25	31.00	1/26/27	28.78	3/23/20	2.22
Mobile	68	30.79	1/26/05	28.76	9/27/06	2.03
Modena	39	30.96	12/23/24	28.91	1/27/16	2.05
Montgomery	60	30.88	1/5/24	29.08	2/27/02	1.80
Moorhead	53	31.18	12/28/17	28.54	3/15/20	2.64
Nantucket	53	30.99	1/1/90	28.32	11/14/04	2.67
Nashville	67	30.97	1/3/24	29.02	2/27/02	1.95
New Haven	67	31.04	2/1/20	28.11	9/21/38	2.93
New Orleans	69	30.83	1/6/24	28.11	9/29/15	2.72
New York	58	31.01	1/27/27	28.38	3/1/14	2.63
Norfolk	40	30.96	2/28/34	28.35	3/6/32	2.61
Northfield	39	31.14	1/31/20	28.35	1/3/13	2.79
North Head	55	30.79	2/16/39	28.72	1/25/14	2.07
North Platte	65	31.13	1/14/27	28.79	5/8/27	2.34
Oklahoma City	31	31.06	1/5/24	29.00	2/26/02	2.06
Omaha	68	31.07	*1/25/25	28.82	3/29/24	2.25
Oswego	31	31.07	1/31/27	28.26	1/3/13	2.81
Palestine	58	30.97	1/5/24	29.13	2/27/02	1.84
Parkersburg	51	30.91	1/18/21	28.76	1/11/18	2.15
Pensacola	60	30.78	1/6/24	28.51	9/28/17	2.27
Peoria	26	31.01	12/20/24	28.89	3/11/23	2.12
Philadelphia	69	31.02	1/27/27	28.54	3/6/32	2.48
Phoenix	45	30.62	*12/34/89	29.32	5/18/02	1.30
Pittsburgh	67	30.97	2/9/34	28.82	1/12/18	2.15
Pocatello	41	31.04	1/21/30	29.06	1/28/28	1.98
Port Arthur	23	30.88	1/6/24	29.37	10/16/23	1.51
Portland, Maine	67	31.09	2/1/20	28.49	11/18/73	2.60
Portland, Oreg.	68	30.83	2/2/80	28.56	1/9/80	2.27
Providence	26	31.02	2/1/20	28.51	3/1/14	2.51
Pueblo	51	31.02	1/14/27	28.87	2/7/37	2.15
Raleigh	53	30.95	*1/2/99	28.57	3/6/32	2.38
Rapid City	52	31.15	2/11/99	28.92	3/14/20	2.23
Reading	31	31.02	2/1/20	28.62	1/3/13	2.40
Redding	11	30.63	1/23/38	29.31	2/9/38	1.32
Reno	34	30.92	1/3/19	29.00	1/27/16	1.92
Richmond	42	31.00	1/2/99	28.58	3/6/32	2.42
Rochester	69	31.05	1/31/20	28.48	1/3/14	2.57
Roseburg	62	30.78	2/16/39	28.92	2/2/15	1.86
Roswell	45	30.83	2/22/11	29.19	3/20/32	1.64
Sacramento	62	30.74	2/17/83	28.95	1/27/16	1.79
St. Joseph	31	31.06	1/5/24	28.83	3/29/24	2.23
St. Louis	40	31.01	12/20/24	28.86	2/28/02	2.15
Salt Lake City	51	31.03	1/17/88	29.03	1/12/32	2.00
San Antonio	55	30.96	1/5/24	28.67	8/20/86	2.29
San Diego	68	30.53	2/17/83	29.46	3/9/12	1.07
Sandusky	61	31.01	1/26/27	28.80	1/11/18	2.21
Sandy Hook	24	31.00	2/1/20	28.44	3/6/32	2.56
San Francisco	48	30.64	3/-/02	28.85	1/27/16	1.79
Santa Fe	30	30.84	1/18/88	29.03	12/-/76	1.81
Sault Ste. Marie	52	31.15	1/26/27	28.58	11/29/19	2.57
Savannah	30	30.75	1/2/99	28.86	3/6/32	1.89
Scranton	39	31.08	1/27/27	28.76	1/3/13	2.32
Seattle	46	30.83	12/3/21	28.80	1/25/14	2.03
Sheridan	32	31.11	12/31/27	28.89	1/12/32	2.22
Shreveport	67	30.95	1/5/24	29.21	8/23/79	1.74
Sioux City	50	31.09	*1/25/05	28.85	3/15/20	2.24
Spokane	59	31.04	1/4/24	28.93	1/25/14	2.11
Springfield, Ill.	51	31.00	1/15/88	28.82	3/11/23	2.18
Springfield, Mo.	52	31.03	1/5/24	28.93	*2/27/02	2.10
Syracuse	37	31.06	12/29/33	28.29	1/3/13	2.77
Tacoma	42	30.82	12/3/21	28.77	1/25/14	2.05
Tampa	30	30.64	12/29/94	28.81	10/25/21	1.83
Tatoosh Island	60	30.80	12/3/21	28.62	1/25/14	2.18
Terre Haute	30	30.97	12/20/24	28.99	3/11/23	1.98
Toledo	67	31.04	1/26/27	28.88	1/12/18	2.16
Trenton	26	30.98	*1/31/20	28.51	3/6/32	2.47
Valentine	51	31.16	12/11/98	28.79	3/14/20	2.36
Vicksburg	30	30.95	1/6/24	29.06	2/27/02	1.89
Walla Walla	54	31.07	1/21/30	29.03	1/25/14	2.04
Washington, D. O.	67	31.01	1/27/27	28.67	3/6/32	2.34
Wichita	61	31.09	1/5/24	28.88	3/29/24	2.21
Williston	61	31.20	2/11/99	28.91	1/10/80	2.29
Wilmington, N. O.	69	30.91	1/2/99	28.65	3/6/32	2.26
Winnemucca	62	31.04	1/17/88	28.93	1/27/16	2.11
Wytheville	30	30.89	2/28/34	29.08	1/11/18	1.81
Yakima	11	30.90	11/22/30	29.07	11/16/30	1.83
Yellowstone Park	36	31.15	12/20/24	28.96	1/12/32	2.19
Yuma	60	30.64	1/24/38	29.37	5/8/02	1.27